PETITION TO LIST THE TAHOE YELLOW CRESS *Rorippa subumbellata* AS A FEDERALLY ENDANGERED SPECIES

December 11, 2000

Mr. Bruce Babbitt
Secretary of the Interior
Office of the Secretary
Department of the Interior
18th and "C" Street, N.W.
Washington, D.C. 20240

The League to Save Lake Tahoe and the Center for Biological Diversity hereby formally petition to list the Tahoe Yellow Cress (*Rorippa subumbellata*) as endangered pursuant to the Endangered Species Act, 16 U.S.C. 1531 et seg. (hereafter referred to as "ESA). This petition is filed under 5 U.S.C. 553(e) and 50 CFR 424.14 (1990), which grants interested parties the right to petition for issue of a rule from the Assistant Secretary of the Interior.

The petitioner also requests that Critical Habitat be designated concurrent with the listing, pursuant to 50 CFR 424.12, and pursuant to the Administrative Procedures Act (5 U.S.C. 553).

The petitioners understand that this petition action sets in motion a specific process placing definite response requirements on the United States Fish and Wildlife Service and very specific time constraints upon those responses.

PETITIONERS

The League to Save Lake Tahoe is a 4,500 member non-profit organization dedicated to preserving the environmental balance of the Lake Tahoe Basin. Through advocacy, public education and growth management, the League seeks to restore and protect the ecological integrity of the Lake Tahoe Basin.

The Center for Biological Diversity is a 5,500 member non-profit organization dedicated to protecting endangered species and wild places of western North America and the Pacific through science, policy, education, and environmental law.

ABSTRACT
The Tahoe Yellow Cress (*Rorippa subumbellata*) is a member of the Brassicaceae [Cruciferae] or mustard family. It has been listed as an "endangered" species by the State of California since 1982 and as "critically endangered" by the State of Nevada since 1980. These listings have not stopped the cress's continued decline. To prevent its complete extinction, the yellow cress must be listed as "endangered" under the U.S. Endangered Species Act concurrent with the designation of protected "critical habitat" areas.

The Tahoe Yellow Cress inhabits a narrow seven foot zone between Lake Tahoe's low water line (6223 ft.) and one foot above the high water line (6230 ft.). Forty-eight populations are known to have historically existed on the shores of Lake Tahoe. (Appendix A) These populations have declined due to extensive development, fluctuating water levels, pier construction and recreation. Only ten populations were found in 1999.

Without immediate federal protection the Tahoe Yellow Cress will become extinct. Plans to raise water levels in accordance with the Truckee River Operating Agreement will inundate yellow cress habitat during the growing season while plans to lift a moratorium on pier construction by the Tahoe Regional Planning Agency will destroy at least eleven cress population centers.

TAXONOMY
SCIENTIFIC NAME: *Rorippa subumbellata* belongs to the Brassicaceae [Cruciferae] family. It was first described in 1941 from a 1919 collection made at Meeks Bay (Stuckey 1972). A complete description of the genus *Rorippa* was conducted 1972, affirming the taxonomic status of *R. subumbellata* (*Ibid*.). The taxon is well defined and not subject to taxonomic debate.

COMMON NAME: The California Native Plant Society refers to *R. subumbellata* by the vernacular name "Tahoe Yellow Cress".

DESCRIPTION
TECHNICAL: The Jepson Manual, Higher Plants of California, describes *R. subumbellata* as: A perennial herb with several, decumbent stems 5-15(20) cm in length, branched; hairs generally crinkled. Leafs are sessile to short-petioled, clasping or not, 1-3 cm in length, oblong to widely-oblanceolate, wavy margined to deeply pinnately lobed; hairs absent or sparse. The inflorescence is more or less umbel-like to more or less elongate. The flower has 2-3mm long sepals that are yellowish, glabrous, persistent in fruit; petals 2.5-3.5 mm, oblong-oblanceolate to spoon shaped, yellow. Fruits are 3-5 mm in length, widely oblong to more or less round, more or less glabrous; pedicel erect to ascending, 3-6 mm, straight; style 1-1.5 mm, glabrous, stigma more or less unexpanded. The seed is approximately 1 mm, plump, more or less angled.

NON-TECHNICAL: In simple terms, Tahoe Yellow Cress is a somewhat fleshy low growing perennial with a slender rootstock. The plant grows in a decumbent, branching morphology with braches 5 to 18 cm long which may be slightly hairy. The leaves have wavy margins that are divided into shallow lobes and may or may not be slightly hairy. The small yellow four-petaled flowers are found on flat or slightly elongated clusters at the end of short stems. The brighter yellow petals being slightly longer than the 2 to 3 mm pale yellow sepals present the most striking visual component of the small flowers. The fruiting body is hairless, short and thick.

DISTRIBUTION

R. subumbellata appears to be endemic to Lake Tahoe (Stuckey 1972). Two historical citations extend the distribution to Tallac Lake, four kilometers south west of Lake Tahoe, and to the banks of the Truckee River, the only outflow of Lake Tahoe (Knapp 1980). However, repeated surveys have failed to relocate the plant at either site. Either these citations were erroneous or suitable habitat no longer exists at these locations (Falkner 1998).

All current populations of *R. subumbellata* fall within a 7-foot band, elevation 6223 to 6230 feet, along sandy shorelines of Lake Tahoe. Populations exist on both the California and Nevada sides of the Lake.

NATURAL HISTORY

PHENOLOGY: *R. subumbellata* has been observed in bud, flower and seed from May to October. Typically, the bud stage extends from mid-May through to mid-June; flowering occurs from late May though early September; and, the seed capsules are evident until the first heavy winter storm, but high water tables and surface flows during spring runoff can impede the growth and bloom of plants (Falkner 1998).

R. subumbellata can reproduce both sexually and vegetatively. The slender rootstock extends deep into beach sands. Lateral root branching is common, often producing aerial stems at the branches (Falkner 1998). Preliminary experiments suggest root branching as a potential mechanism for vegetative reproduction (Ferreira 1987).

Details regarding the modes of reproduction, and the factors that affect it, are not well understood. To date few studies have been done on *R. subumbellata's* reproduction under natural or greenhouse conditions (Ferreira 1987), but those studies have suggested that plants likely become established on unoccupied, suitable habitat via seed (Falkner 1998).

HABITAT: The typical habitat for *R. subumbellata* is open, sandy beaches or dunes, especially near the shoreline of the Lake, stream mouths, and back lagoons. Plants are found almost exclusively within a few feet of the waterline

and/or at the same elevation as the Lake within sandy soils. Substrate moisture appears to be an important determinant of *R. subumbellata* distribution. Plants are often found on sandy beaches in association with stream mouths and back beach depressions, within a surface substrate known as the armor layer or growing within beach detritus (Falkner 1998). The armor layer consists of course sands left behind as wind erosion removes the finer particles. This layer, as well as detritus, is thought to provide a protective surface boundary that inhibits soil moisture from evaporating (Falkner1998). However, in areas where soil remains saturated for repeated growing seasons, wetland species such as willow, alder, rush, and grasses may colonize and displace *R. subumbellata* (Falkner 1998). The species apparently does not compete well, as it is rarely found growing with any other plants (Knapp 1979).

SIGNIFICANCE

Rorippa subumbellata is endemic to the Lake Tahoe Basin. It is an indicator of the health of a unique habitat type: sandy beaches.

STATUS AND THREATS

GENERAL ASSESSMENT: "Tahoe Yellow Cress (TYC) occurs in a dynamic environment governed by both natural processes and human activities. Under natural circumstances, TYC is likely tolerant of the dynamic nature of its habitat and is adapted for survival in a disturbance regime. The additions of human activities change the extent and duration of the natural disturbance regimes and add new disturbances. The number of occupied sites has declined dramatically since the early 1990's. This decline is thought to be only partially due to high-water levels and habitat inundation, since populations were absent from some high elevation sites where inundation did not occur. The absence of TYC from previously occupied sites suggests other factors are involved in its disappearance. One speculation is that a combination of reduced habitat and increased human disturbance is the primary reason for the observed decrease in population numbers." (Falkner 1998).

HISTORICAL DECLINES AND CURRENT INSTABILITY: Currently, sufficient information is not available for accurate individual delineation. Consequently, surveys simply account for presence or absence of plant(s) without attempting to count individuals, assess the health of existing plants or evaluate habitat viability. The California Tahoe Conservancy (CTC) has monitored for the presence of *R. subumbellata* during fifteen seasons spanning twenty years. (Appendix A) Historically, forty-eight occurrences of *R. subumbellata* have been located (CTC Monitoring Data). Five of these have not been relocated since their historical discovery. Of the remaining forty-three occurrences, two have had no sightings and/or surveys since 1979. While five other locations have only had one recorded sighting, three of these sightings occurred during low water ($\leq$ 6224 elevation) when the largest amount of habitat is available. Low water has occurred five of fifteen monitoring years or 33% of monitoring.

High water dramatically impacts the amount of habitat available while simultaneously intensifying recreation on habitat that remains. High water (>6227 elevation) has occurred nine times during fifteen years of monitoring or 60% of survey years. Of the forty-eight historically cited occurrences only twenty-four are known to have had plant(s) present during high water years ($\geq$ 6227 elevation). (Appendix B) Only fourteen locations were surveyed to have plants present during high water years both in the 1980's and the 1990's. Of these, only six locations are stable, having plants present all of the last five high water survey years. Only three of these locations are protected by exclosures. Five locations are unstable, locations either not surveyed or having plants present two or fewer times during the last five high water survey years. Three locations are marginal, plants present three or more times during the last five high water survey years.

PRESENT OR THREATENED DESTRUCTION, MODIFICATION, OR CURTAILMENT OF HABITAT OR RANGE

NATURAL CONDITIONS

Changing Lake Surface Elevations – Variable lake levels have a great effect on available habitat. During years of high water levels, most of the available habitat is under water. Under natural conditions, *R. subumbellata* has evolved to successfully cope with naturally occurring fluctuations, however, limited beach areas intensify other uses within available habitat during years of high water level.

Sand Movement by Water Erosion – Waves generated by wind during periods of high lake level can erode and alter beaches. The mouths of streams can erode and re-form beaches during periods of high runoff. These actions can remove aerial stems and rootstocks (Falkner 1998).

Competition with Other Plant Species - *R. subumbellata* does not compete well against other plants (Knapp 1979). During periods of high water levels, wetland species such as rushes and willows will colonize much of the available habitat (Falkner 1998). If water levels remain high for a number of seasons, these wetland species may completely displace *R. subumbellata* at particular locations (Falkner 1998).

HUMAN INDUCED CONDITIONS

Substrate Disturbance – Soil samples collected within historic *R. subumbellata* exclosures indicated obvious soil moisture near the surface, textural changes with depth and a coating of organic material on individual grains. This is in contrast to samples collected in areas of heavy foot traffic, where the sand was uniformly mixed and dry 30 cm below the surface, as well as devoid of organic material. Substrate disturbance also removes the armor layer often associated with *R. subumbellata* (Falkner 1998).

Construction and Development – The inability of *R. subumbellata* to reestablish at some sites where it had existed in the past appears to be related to human disturbance (Falkner 1998). Disturbance from heavy equipment and building materials pose an immediate risk of destroying individual plants and/or necessary substrate conditions (Knapp 1979). Other impacts associated with development such as off-road vehicle use, trash burning, illegal dumping, sand raking, shading from furniture and boats, increased foot traffic between piers, and conversion of native plants to ornamental landscaping contribute significantly to detrimental impacts (Knapp 1979, Falkner 1998).

Recreation – In addition to physically destroying the plant, heavy recreational use can result in beaches less suitable for plant growth due to substrate disturbance (Falkner 1998). Localized recreational disturbance is generally considered one of the greatest threats to *R. subumbellata* and may account for the loss of the plant at heavily used beaches (Falkner 1998). Beach use patterns are closely linked to lake levels. As lake levels rise, beaches become smaller and recreational disturbance is intensified, resulting in increased foot traffic and trampling of unprotected plants and destruction of habitat (Falkner 1998, Knapp 1979). High water ($\geq$6227 elevation) presently occurs 68 percent of years on Lake Tahoe (CTC Monitoring Data). The Truckee River Operating Agreement will maintain higher water levels during the reproductive period of *R. subumbellata* and concentrate recreation on available habitat.

OVERUTILIZATION FOR COMMERCIAL, RECREATIONAL, SCIENTIFIC, OR EDUCATIONAL PURPOSES

R. subumbellata is not used for commercial, recreational, scientific or educational purposes. Destruction of plants is a result of other activities.

DISEASE OR PREDATION

Although grazing of *R. subumbellata* by Canadian geese appears to have a relatively small impact, geese numbers are increasing, as is the length of their stay at Lake Tahoe. Geese impacts therefore, may increase to a significant level, especially if *R. subumbellata* populations decrease at the same time.

INADEQUACY OF EXISTING REGULATORY MECHANISIMS

The 75 mile Lake Tahoe shoreline is managed by a matrix of private, state, regional and federal authorities. Approximately 45 miles (60%) of the shoreline is in California, with the remaining 30 miles (40%) in Nevada. Approximately 33 miles (44%) of the shoreline is in public ownership.

Private Authority. Approximately 42 miles (56%) of Lake Tahoe's shoreline is privately owned. (Shorezone DEIS) Of the ten occurrences of *R. subumbellata* last year, four were on private property and six were on public land. Twenty-five of forty-three confirmed sites have occurred on private property while the remaining eighteen sites have occurred on public land. (Shorezone DEIS) Of the ninety-one parcels where plants have existed, seventy-eight are privately owned.

Approximately eight hundred parcels around Lake Tahoe have potential *R. subumbellata* habitat. (Pers. Comm. with Coleen Shade) Conservation action by private landowners is voluntary and not well documented.

State Authority. The State of California listed *R. subumbellata* as an "endangered" species in 1982. Responsibility for the protection of endangered plants is given to the California Department of Fish and Game (CDFG). Projects proposed in potential habitat and/or population locations are to be reviewed through consultation and permitted by the CDFG. Protection of plants is accomplished through project modification, mitigation, or denial. To date, no project has been denied due to potential impacts to plants or habitat.

The California Department of Parks and Recreation manages approximately nine miles of Lake Tahoe shoreline. The beaches that are managed by this agency are used heavily for beach recreation including the beaching of boats. Parks and Recreation land has historically supported six *R. subumbellata* sites. Currently, only one population exists within the single exclosure managed by Parks and Recreation. This exclosure is located on a heavily recreated beach in D. L. Bliss State Park. The 2,275 square foot exclosure does not provide the needed protection from disturbance. The exclosure is only two feet high and is often used as a bench, boat tie-up, play pen, and/or holding area for beach toys. Additionally, the design of the exclosure prevents sand movement into and out of the exclosure. Heavy disturbance is visible within this exclosure (footprints) and it is poorly maintained. (Appendix C)

California State Lands Commission wrote a Draft Biological Assessment for Tahoe Yellow Cress in 1998. This report provided a complete summation of the plants biology, status and trends, factors affecting the plant, current management, and recommended research. However, no specific conservation or management recommendations were made and no compulsory actions are required. A final report has not been completed.

The State of Nevada listed *R. subumbellata* as "critically endangered" in 1980. The Nevada Division of Forestry (NDF) administers regulatory authorities granted by this listing. The Nevada Division of Wildlife manages analogous listings of mammals and invertebrates. Nevada law requires the completion of a permitting process through NDF for projects that present a threat to known populations and/or habitat of critically endangered plants. This authority extends to state and privately held land, management of federal land is not intended under this law, although interpretations of this law vary. The NDF controls impacts to plants and/or habitat through project modification, mitigation, or permit denial. However, despite the fact that several projects have occurred in potential habitat, NDF has only permitted two projects. No project has ever been denied due to potential impacts to plants or habitat. No protection plan has been developed and permanent habitat protection is not required.

Nevada Division of State Parks manages three miles of Lake Tahoe shoreline within Sand Harbor State Park. Over 300,000 recreationists visit this park each year. The Tahoe Yellow Cress habitat in Sand Harbor is also the primary recreational attraction. No protection plan has been developed and no habitat exclosures exist. Tahoe Yellow Cress has not been observed on this property since1979. (CTC Monitoring Data)

Regional Authority. The Tahoe Regional Planning Agency (TRPA) was established in 1980 and has congressional authority as granted in the bi-state Tahoe Regional Planning Compact. This authority extends to the use of federal, state, and private lands. However, the TRPA does not have the authority to regulate lake levels. This authority lies with the Federal Water Master. The TRPA lists *R. subumbellata* as a "sensitive" species and has a non-degradation threshold to maintain a minimum of twenty-six specific population sites.

The TRPA has a standard condition of approval for projects located in identified *R. subumbellata* habitat that requires a survey for plant presence, temporary mitigations and/or "minor adjustments of construction plans." The preferred method of dealing with potential impacts is to locate development away from populations and/or mitigation, despite the agency's authority to prohibit any disturbance to populations and/or habitat. No protection plan has been developed and permanent habitat protection is not required. Existing protection measures have not provided adequate protection to achieve or maintain the minimum required threshold population sites.

The Tahoe Regional Planning Agency recently completed the Lake Tahoe Shorezone Ordinance Amendments Draft EIS (April, 1999) which analyzes the effects of lifting a twenty year moratorium on pier construction in prime fish habitat. If the preferred alternative is adopted there is the potential for development of new facilities and 477 new piers along the shoreline of Lake Tahoe. The Final EIS is due to be completed this spring with a decision to be made by the Planning Agency Governing Board by late summer of 2001.

A large number of *R. subumbellata* sites are located within prime fish habitat and thus afforded some degree of protection by the moratorium. Allowing the proposed amount of development and resulting recreation to occur in *R. subumbellata* habitat will have profoundly negative effects on this species. The DEIS identifies the loss of eleven *R. subumbellata* sites under the preferred alternative. The DEIS did not disclose which sites will be lost, nor has TRPA staff been able to identify these locations. Presently, only ten sites around Lake Tahoe have *R. subumbellata* populations.

Federal Authority. *R. subumbellata* is listed as a candidate for federal listing by the U.S. Fish and Wildlife Service. This designation affords no protection under the Endangered Species Act.

The U.S. Forest Service Lake Tahoe Basin Management Unit (LTBMU) manages ten miles of shoreline. With more than 750,000 annual visitors (Don Lane 2000 pers. comm.), these beaches are some of the most accessible and desirable beaches on Lake Tahoe. The popularity of these beaches is largely the result of the easily accessible sandy beaches and the recreational opportunities that they provide. The LTBMU presently manages three exclosures, Nevada Beach (11,825 s.f.), Taylor Creek (18,777 s.f.), and Cascade Creek (16,000 s.f.). The exclosure at Nevada Beach is currently thought to be ineffective due to the limited amount of suitable habitat protected, species composition change with resulting competition, and the incomplete, crescent shaped design of the exclosure. (Appendix D) The LTBMU has historically supported 21 populations of *R. subumbellata*. The LTBMU lists *R. subumbellata* as a "sensitive" species, but has not developed a management plan and permanent habitat protection is not required. Six populations exist on LTBMU managed land presently.

Truckee River Operating Agreement (TROA) – The Federal Water Master has recently proposed changes in the operation of the Truckee River Dam, located at Lake Tahoe's only drainage, which will alter the seasonal reservoir capacity by maintaining higher water elevations during spring and summer, the growing season for *R. subumbellata* (Stone 1991). Computer simulations completed by the Department of Water Resources indicate that water levels would be 0.10 to 0.24 feet higher with TROA 22% of all years during the 95-year simulated period (USFWS 1996). "Data on relative amounts of sandy substrate to other substrates within the shorezone are currently lacking. Therefore, changes in shorezone area with fluctuating lake surface elevations constitute only an estimate of changes in Tahoe Yellow Cress habitat area." (USFWS 1996).

Historical lake surface elevations during the period 1901 to 1994 illustrate that mean annual lake surface elevation exceeded 6227 feet in 48 out of 94 years (51 percent) and exceeded 6228 feet 16 out of 94 years (17 percent). Thus, mean annual lake surface elevation has exceeded 6227 feet 68 percent of the last 99 years. Compounding this is the fact that a one foot lake elevation gain from 6227 feet to 6228 feet inundates 30 percent (739 acres) of the shorezone (USFWS 1996). This is the largest decrease in shorezone acreage from any other one-foot lake elevation rise between the historical low elevation of 6220 feet and the maximum legal elevation of 6229 feet. Any additional increase to lake elevation could have a significant impact on the documented high water occurrence sites, particularly the fourteen sites known to have had high water populations in the 1990s.

CRITICAL HABITAT DESIGNATION RECOMMENDED

Petitioners strongly recommend the designation of critical habitat for *Rorippa subumbellata* coincident with its listing. Its demise is clearly related to disturbance and impacts associated with recreation and development in its shoreline habitat. Collection and vandalism are not a threat to the species. Critical habitat should be designated in all areas where it is currently located and in key

unoccupied or inundated areas where restoration is necessary for the conservation of the species.

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Respectfully submitted,

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